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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/658,874	09/10/2003	Samir Kumar	D/A2425	3222
25453	7590	02/21/2006	EXAMINER	
PATENT DOCUMENTATION CENTER XEROX CORPORATION 100 CLINTON AVE., SOUTH, XEROX SQUARE, 20TH FLOOR ROCHESTER, NY 14644			ZACHARIA, RAMSEY E	
		ART UNIT		PAPER NUMBER
		1773		

DATE MAILED: 02/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/658,874	KUMAR ET AL.	
	Examiner Ramsey Zacharia	Art Unit 1773	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 19 January 2006.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-8, 13-21 and 23-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-8, 13-21 and 23-31 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date \_\_\_\_\_.

- 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_.  
 5) Notice of Informal Patent Application (PTO-152)  
 6) Other: \_\_\_\_\_.

**DETAILED ACTION**

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

***Continued Examination Under 37 CFR 1.114***

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 19 January 2006 has been entered.

***Claim Rejections - 35 USC § 103***

3. Claims 1-8, 10-21, 23, 24, and 26-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Drappel et al. (U.S. Patent 6,391,509).

Drappel et al. teach a carrier comprising a core and a polymer coating which comprises a mixture of a coating polymer and a conductive polymer (column 5, lines 47-49). The conductive polymer may be polyaniline having a weight average molecular weight of about 10,000-400,000, about 20,000-100,000, or about 22,000-75,000 with an  $M_w/M_n$  ratio of about 1.4 to 2 (column 5, lines 56-62). The coating polymer may be formed of a mixture of polymers, including polymers that are not in close proximity in the triboelectric series and mixtures of about 2 to 7 polymer (column 5, lines 49-55). The conductive polymer may comprise as little as about 5 wt% of the

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total weight of the coating (column 5, line 66-column 6, line 5). The core has a diameter of about 30 to 100  $\mu\text{m}$  (column 6, lines 6-7). The core is made of iron, steel, or a ferrite (column 6, lines 7-8). The coating polymer may be, for example, a styrene polymer, polymethyl methacrylate, or a mixture of polymethyl methacrylate and polytrifluoroethyl methacrylate (column 6, lines 8-19). The polymer coating is present in an amount of from about 0.5-10 wt% or about 1-5 wt% of the carrier (column 6, lines 19-22). The carrier may have a conductivity of about  $10^{-15}$  to  $10^{-4}$  ( $\text{ohm}\cdot\text{cm}$ ) $^{-1}$  and a triboelectric charge value of about -60 to 60 microcoulombs/gram (column 6, lines 22-26). The carrier may be combined with a toner to produce a developer (column 7, lines 12-13). The toner may comprise a thermoplastic resin, colorant, and other optional components (column 7, lines 15-18). The conductive polymer may be any of a number of commercially available conductive polymers (column 8, lines 62-64). Suitable commercially available conductive polymers include Eeonomer (column 9, lines 56-60), which is the same material used in the instant invention (see pages 13 and 14 of the instant specification, particularly page 14, lines 6-9 in which Eeonomer is described as being comprised of intrinsically conductive polypyrrole or polyaniline polymers deposited into carbon black matrix by an in situ polymerization.

Drappel et al. do not teach a concentration of the conductive polymer in the coating of about 0.1 wt%. However, Drappel et al. do teach a carrier having a triboelectric charge value of about -60 to about 60 microcoulombs/gram and a conductivity of about  $10^{-15}$  to about  $10^{-6}$  mho/cm (column 7, lines 57-60). Since the conductivity and triboelectric charge value of the carrier are functions of the concentration of conductive polymer, the concentration of conductive polymer is a results effective variable. Therefore, it would have been obvious to one having

ordinary skill in the art at the time the invention was made to optimize the concentration of conductive polymer in the carrier (and thus in the polymer coating), since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

*In re Boesch*, 617 F.2nd 272, 205 USPQ 215 (CCPA 1980). Moreover, such an optimization would be expected to result in a material that reads on that of the instant invention since the triboelectric charge value and conductivity of the instant carrier (about -60 to about 60 microcoulombs/gram and a conductivity of from about  $10^{-12}$  to about  $10^{-4}$  mho/cm) fall within the range taught by Drappel et al. (see page 11, lines 2-4 of the instant specification).

Regarding claims 7 and 8, Drappel et al. do not teach that the conductive polymer is polypyrrole having molecular weights as recited in claims 7 and 8.

However, Drappel et al. do teach that the polyaniline as the conductive polymer may have a weight average molecular weight of about 10,000-400,000, about 20,000-100,000, or about 22,000-75,000 with an  $M_w/M_n$  ratio of about 1.4 to 2 (column 5, lines 56-62). Drappel et al. further disclose that polyaniline and polypyrrole are functionally equivalent materials for the purpose of their invention (column 7, lines 24-28).

One skilled in the art would be motivated to use a polypyrrole having a weight average molecular weight of about 22,000-75,000 with an  $M_w/M_n$  ratio of about 1.4 to 2 in place of the polyaniline having a weight average molecular weight of about 22,000-75,000 with an  $M_w/M_n$  ratio of about 1.4 to 2 taught by Drappel et al. since Drappel et al. teach the equivalence of polyaniline and polypyrrole.

4. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Drappel et al. (U.S. Patent 6,391,509) in view of Viswanathan et al. (U.S. Patent 6,764,617).

Drappel et al. teach all the limitations of claim 25, as outlined above, except for the use of a polyaniline attached to lignin. However, Drappel et al. do teach that the polyaniline may be doped with an organic acid, preferably a sulfonic acid (column 8, lines 65-67).

Viswanathan et al. is directed to a composition comprising polyaniline doped with a lignosulfonic acid compound (column 1, lines 61-64). Lignosulfonic acid compounds are abundant and inexpensive (column 5, lines 15-16).

One skilled in the art would be motivated to use a lignosulfonic acid as the sulfonic acid of dopant Drappel et al. because it is inexpensive and known to be suitable for doping polyaniline.

#### *Response to Arguments*

5. Applicant's arguments filed 19 January 2006 have been fully considered but they are not persuasive.

The applicants argue that Drappel et al. does not render the claims obvious because one skilled in the art would not expect that a carrier with about 0.1 wt% of conductive polymer in the polymer coating would be useful for the purposes given by Drappel et al.

This is not persuasive for the following reasons. As outlined above, Drappel et al. teach ranges for the conductivity and triboelectric charge value of their carrier that completely encompass the range of values disclosed in the instant application. Because the conductivity and triboelectric charge value are a function of the concentration of conductive polymer, it would be

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obvious to one skilled in the art to optimize this concentration to obtain a carrier having any conductivity and triboelectric charge value within the disclosed ranges. Moreover, because the ranges taught by Drappel et al. completely encompass the ranges of conductivity and triboelectric charge value cited in the instant specification, optimizing the concentration of conductive polymer would be expected to result in a carrier having a concentration of conductive polymer that reads on the concentration of instant claim 1.

***Conclusion***

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ramsey Zacharia whose telephone number is (571) 272-1518. The examiner can normally be reached on Monday through Friday from 9 to 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney, can be reached at (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ramsey Zacharia  
Primary Examiner  
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